1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

245 than the Riffian variety. They are grown on trellises outside of and trailing onto the houses, and along the village paths. Since they are trained to climb up trellises, they are not cut back like the Riffian grapes, but are allowed to grow as long as they will, for purposes of shade.

Cactus. The one species of cactus found in the Rif, the prickly pear variety, is called by its Arabic name, *karamus en Nsara*, or the Christian fig. It is found along the seacoast, in the eastern tribes up to Beni Tuzin and Gzennaya, and in the southern part of Gzennaya. It is absent in northern Gzennaya, in southern Beni Urriaghel, in Beni Amart, and in the Senhaja Sghir. Where it is grown it serves as a convenient fence about the house, and as a [438] supply of mediocre food in time of famine. Women and young girls pick its fruit, remove the needles, and sell it in market at a low price.

244 **Garden Plants and Care of Gardens.** *batata*, the potato. This vegetable is obviously of American origin, although it has been grown for a long time in the Senhaja and central Rif and has become an integral part of the local culture. It is divided into two varieties: the reddish type, the more frequent, and the white type, found chiefly in Beni Amart. The white is considered the older. Potatoes are grown only where there is irrigation, and then usually in terraces.

er khizzu, the carrot. This vegetable, considered to be of Arab introduction, is not favored and is rarely grown.

er baer, the onion. This is planted in the following manner: in March onions are cut in two or more pieces lengthwise and planted; these pieces are allowed to grow big and go to seed, and the seeds are collected and sown in a starting-bed in August: the next year the stalks are cut off and the plants are separated and transplanted.

jifth, the white turnip.

er firfir, the pepper. Peppers are specially treated, being fertilized with goat manure when they begin to flower.

jubshth, a species of small bean.

ibauen ibershanen, black beans.

thakhseshth, a type of vegetable marrow or squash.

thakhseshth n yieri, the gourd, raised for bottles only and not eaten.

243 **Cultivation of Grains and Leguminous Plants.** *dra thesdat*, durra, is considered by the Riffians to be of recent introduction from the Negro country. It is grown only by men who have no terraces whereon to grow maize (*dra*), since it can be grown dry. It is not greatly valued and is not commonly grown.

shinti, rye,[1] is grown without irrigation on the mountain slopes where the land, too steep for ploughing, may be worked with the hoe. It may be grown on land which does not belong to the farmer, beyond the reaches of ordinary agriculture, and hence is an important source [262] of food supply for families owning insufficient arable land. The Riffians prize rye highly, considering it rich in food value and a strength producer. Since the Arabs ridicule them for eating it, the Riffians seldom discuss the subject with strangers, or produce food made from

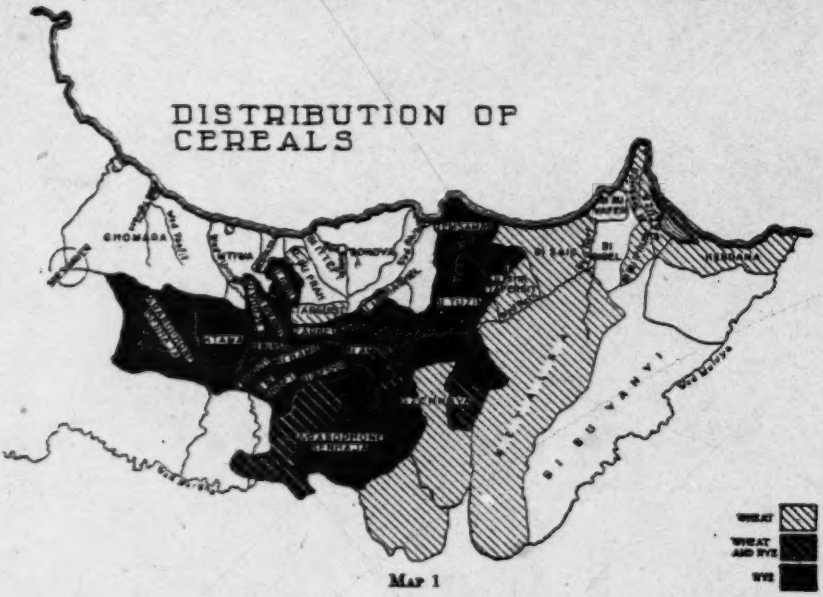
[1] Samples of *shinti* from Gzennaya, now in the Harvard Botanical Museum, have been identified by F. Tracy Hubbard of the Harvard Botany Department as rye. Moulieras mentions *shinti* in his description of the Beni Bu Nsar, calling it "une sorte de blé blanc." Procopius ascribes the cultivation of a grain called ὅρυζα to the mountain Berbers of his time. This grain, identified with the Latin *oriza*, was perhaps rye. Moulieras, *Le Maroc Inconnu*, vol. i, p. 55: Procopius, bk. iv, chap. 6, l. 13; Freund, Latin-English Lexicon; Liddell and Scott's Greek-English Lexicon, unabridged, 1882 edition: Vavilov, *The Origin of Cultivated Plants*, p. 266.

1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

243 it when guests are present. It is another of the innocuous things of which they are curiously ashamed.

imindhi, barley, is the universal grain, being grown everywhere except in Taghsuth. It is grown on irrigable plough-land, in the regions where irrigation is practised.

erden, wheat, is found only in the east, in the lowlands, and in flat plateau country, notably at Bured and Targuist, where it has recently been introduced. The mountain [262] farmers consider wheat extravagant and low in food value, while the lowlanders think it the only aristocratic cereal. The distribution map for rye and wheat shows clearly the relative



Map 1

ranges of these cereals, both being largely regulated by environmental zones. I have not depicted the range of barley, since it is found wherever grain is grown except in Taghsuth.

er kortar, oats, are not cultivated in the Rif, but grow wild, and are sometimes gathered and eaten.

243 252 *shasana* is a leguminous plant resembling vetch, the English name of which, if any exists, I do not know.[1] It is grown in the same manner as peas and lentils. These leguminous plants are considered by the Riffians to belong with grains rather than with vegetables, hence I have followed the native usage in considering them in this place. *Shasana* is said to be poisonous when eaten without treatment. Like acorns, the *shasana* is placed in a basketry container and allowed to rest in the bottom of a stream, weighted down with stones,

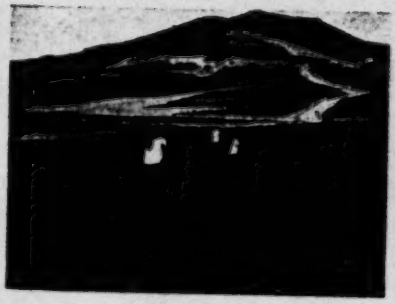
[1] Specimens brought to the Harvard Botany Department are being studied.

1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

243

Reaping, Targuist

Tying the sheaves, Beni Said



Gleaners, Beni Said

Threshing with mules, Targuist

[facing p. 48]

1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

243 [252]

for several weeks. At the end of this time the poison is supposed to be washed out, and the product is dried and eaten.

thinifin, peas, *ibauen*, broad beans, and *er athis*, lentils, like *shasana*, are grown as grains.

241 805 T93

The Calendric Cycle of Agricultural Events. Agriculture in the Rif and in the Senhaja country is conducted on the basis of the old Roman calendar, the names of the months surviving in a form very little altered from its original character. I was unable to transcribe these names exactly since I could find no one who knew them accurately and was willing to reveal them. Knowledge of them is confined to the *fkih*, the preceptor or religious head of each group of villages, and to his students. The *fkih*, while delivering sermons at the mosque on Fridays, reveals the agricultural program for the following week and tells the farmers just what activities the season merits. To reveal this calendar system and the agricultural annotations which go with it woud be to relinquish a portion of the awe in which the religious leader is held.

The preceptor likewise knows the Arabic lunar calendar and is the only one able to tell when religious feasts of Arab origin are due. The farmers reckon only by the four seasons, a solar conception which may well antedate either the Roman or the Arabic system. They know, however, about when each activity is due, since they are in the habit of repeating the program every year. and could probably get along as well without the learned assistance of the *fkih* as with it.

241 805

A rough outline of the year's activities follows.

January. In this month the farmers plough their land. (See plate 9.) When this has been finished they sow barley and *shasana*, and later broad beans and lentils.

February. If the bean and lentil sowing has not been finished in January, it continues over into early February. Sometimes it continues until the end of the month.

March. About the first of March the farmers hoe the mountain slopes and sow rye and peas.

April. On the first of April they commence planting the vegetable gardens with potatoes, beans, carrots, turnips, onions, and peppers.

May. This is the month for trees. The farmers dig around the roots, fertilize them with manure, and water them. After the trees have been cared for in this way and pruned, the soil about the grapevines is loosened and fertilized with manure, without water. At this time the grapevines are also pruned.

June. Toward the beginning of June, or sometimes during the last week of May, the farmers reap the *shasana*, lentils, barley, and peas, in the order named. The barley is cut with sickles; the others are pulled up by the roots and laid aside for threshing. After this has been done the farmers irrigate the terraces in which the *shasana*, lentils, peas, and barley have been growing (see plate 9) and plant them with maize. The plants previously reaped are then threshed, first the *shasana*, which is the most susceptible to insect pests and cannot wait, then the lentils and peas, and finally the barley. All this threshing is done with cattle, donkeys, or mules, which are forced to trot around a circular threshing floor. (See plates 10 and 11.) Toward the last of June the rye is cut, and the women thresh it by hitting the heads of the sheaves against sticks held in the hand. It is tabu to thresh rye with cattle, just as rye is never planted by means of domestic animals or the plough. The whole rye complex seems to antedate or at least to be negatively associated with the cattle and plough complex.

241 which a little bag containing some earth from the shrine is hung on it, and the farmer promises to give a present to the saint if the animal improves.

The ploughman, who is called in Arabic l-harrat or l-hammas and in Berber aharrat (Ait Nder, Ait Yusi) or ahammas (Ait Warain, Ait Waryager), is subject to certain rules the transgression of which is supposed to injure the crops. It is considered necessary that he shall be sexually clean; if he has had intercourse he must wash himself before he commences his work, since otherwise there would be [219] no baraka, or holiness, in the seed or there would grow mostly grass and weeds on the field.

[220] In Andjra the seed is likewise kept carefully apart from other grain; and both there and elsewhere (Garbiya, Ait Waryager, Temsaman, Ait Yusi) it is believed that if a child or unmarried person passes ahead of the sower so that some of the cast seed touches him or her, that person will never marry—"the bas will remain in him till his death".

243 [227] When the reaping is finished, or also every afternoon successively as long as it lasts, the reaped corn is carried to the place in the open where it is going to be threshed. This threshing-floor of earth is called in Andjra nwader, in the Hiaina nader, in the Garbiya and among the Ulad Bu'aziz, as also among other Arabs of the plains, ga'a; and among the Berbers anrar (Aglu, Amanuz, Demnat, Ait Yusi, Ait Nder), anrar (Ait Warain), andra (Temsaman), annar (Ait Waryager), arnan (At Ubahti), rrhabt (Ait Sadden). Two stacks are made there, one of barley and another of wheat, unless indeed there happen to be different kinds of wheat which the owner wishes to keep separate.

[229] The corn is generally trodden out on the threshing-floor by animals—horses, mules, donkeys, or in some tribes, e.g. the Ait Nder, by oxen. The wheat is commonly subjected to this process a second time, if there is any considerable quantity of it, in order to be cleared of the husks which may still cling to it; but the barley is threshed first so as to supply the animals with fodder.

[232] The heap of ready threshed corn—which is called in Arabic saba, and in Berber tirrit (Igliwa), tirst (ibid., Amanuz, Aglu), tirrst (Ait Nder, Ait Yusi, Ait Sadden), tirrejt (Ait Warain), dirrest (Ait Waryager), tiarrest (Temsaman)—is protected against jnun by salt (Hiaina, Andjra, Ait Waryager, Ait Warain, Igliwa), tar

243 (Ait Yusi), rue (Hiaina), or harmel (At Ubahti), and extremely frequently by a sickle or a dagger.

251 [242] Among the people of the plains the grain is stored in subterranean granaries consisting of a circular, bottle-shaped pit, the mouth of which is carefully sealed. Such a granary is called in Arabic matmura (Ulad Bu'aziz) or matmur (plur. mtamar; Andjra), and in Berber tasraft (plur. tiserfin; Aglu), tasraft (plur. tiserfin; Ait Warain), tasraft (plur. tiserfin; Ait Yusi, Ait Sadden, Ait Nder), dasraft (Ait Waryager). At each village there is a place, called l-mers, which contains a larger or smaller group of these pits.

251 778 [243] In Andjra baraka is added to the grain by a piece of bread being placed in the matmur; while the Ait Waryager, according to a scribe from their tribe, believe that the holiness of the granary itself may make the grain increase after it has been put there.

[244] The grinding of the corn is also subject to certain rules. Evil influences of various kinds must be avoided.

[245] The Igliwa do not even touch grain after 'asar, and in Andjra and among the Ait Waryager nobody is then allowed to lend his hand-mill to a neighbour.

776 778 [247] The Ait Waryager put tar and flour into the wooden box or earthenware vessel in which money is buried—tar in order to prevent the jnun from striking the owner when he again digs up his money, and flour, I was told, to keep the money clean. But perhaps the latter also is intended to serve as a protection against those spirits; in the same tribe a little salt and a grain of barley are sometimes put into a written charm to prevent it from being spoilt by jnun, who are said to be afraid of corn after the ra'sor (la-'sor) has been paid [783] out of it. At the Great Feast flour is used as a means of purifying the sacrificial animal before it is killed; and people who have attended a burial purify themselves by touching flour.

784 [249] In the Garbiya, the Hiaina, and elsewhere nobody would give away yeast from the house or tent after 'asar; to do so would be to give away the rezq or baraka (Ait Waryager).

4/2 The sieve—called in Arabic garbal (garbal, gurbal), karballu, or garballu, and in Berber tallunt (Amanuz, [250] Ait Warain), tallunt (Ait Sadden, Ait Yusi), dardund (Ait Waryager), arkkut (At Ubahti)—which is made of pierced sheep- or goatskin with a wooden rim, must also be handled with caution.

132 mean would be somewhat higher in the highlands, the range of
[243] variation would be as great. Since the economic backbone of the area is the dry farming of cereals, low rainfall or drought causes serious difficulties.

175 The history of the Rif presents us with the strange paradox that it is better documented for the eleventh and twelfth centuries than for the nineteenth. We have several written chronicles of the Arab city states established along the Mediterranean, such as Nekor which drops out of history in the eleventh century, and Bades which was captured by the Spanish in the sixteenth century. Of the Berbers in the hinterland we have
[113] little material with the exception of el-Badisi's Lives of the Saints of the Rif (French translation by Colin, 1926) dated 1311, and el-Bekri's Description de l'Afrique septentrionale from the eleventh century. El-Bekri notes that already in that time most
[131] of the present tribes of the Rif were located in their present
[648] sites (Michaux-Bellaire, 1925: 180-181). Between these accounts, fragmentary at best, and the uncritical chronicles of Spaniards leading punitive expeditions in the late nineteenth and early twentieth centuries, Riffian history is rather blank.

175 Geographical circumstances made the Central Rif peripheral
648 to most events going on in Morocco. Only with the insistence of the Spanish government did the Moroccan Sultan send an expedition into the Rif in the late nineteenth century to punish the Ibuqquyen for piracy. During the early years of the present

Chapter 2

LIVELIHOOD

243 The primary economic activity in the Central Rif is the cultivation of barley. The agricultural cycle is marked by the [221] planting and harvesting of this crop. Ploughing begins during the months between October and January depending on the occurrence of the first rain which is necessary to soften the soil. [407] Breaking the soil is done by wooden ploughs though the blades are made of metal. The terrain is first weeded and cleared of small rocks by the children of the family. Then the father, an 243 492 older son or a hired man commences the ploughing. Two animals, one on each side of the plough, are used. Mules are preferred, but rarely does a man have two. Thus, there is a bizarre mixture of animals including combinations of donkeys, cows and mules. The value of animals on the market is at its highest in this season since everyone needs them for ploughing.

243 After the land has been ploughed by the animals it is [412] broken even finer by the use of a hand hoe. When the land has been sufficiently prepared, the seed is sown by hand. Once the barley has been planted there is no further care of the fields. The crop is dry farmed and its yield depends entirely on the amount of rainfall it receives during the winter.

243 While barley is the predominant crop, maize is an important secondary one. Wheat and rye are also grown but the latter is held in low esteem as a food product[1] and the former does not grow successfully on the thin residual soil of the region. In those areas where there are rivers or streams, small gardens are maintained by irrigation canals. In these are cultivated potatoes, tomatoes, onions, garlic, squash, turnips, green peppers and mint.

241 [312]

245 In addition to the grains, maize, and small vegetable gardens, many households also have orchards of fruit and nut trees. Fig, lemon, orange, pomegranate, walnut, almond, and olive trees are common. In some areas grapes are also cultivated. Around each house is a grove of prickly pears which serves not only as a means of preserving privacy, but also as a source of food. These products not only supplement and add variety to the regular diet but in the case of oranges, almonds and grapes serve as cash crops. The olives are pressed by the women to provide crude cooking oil. Nuts, dried grapes and figs are an important winter food reserve. The work of pruning and grafting goes on during the months of February-March-April.

[258] [262] [221]

243 In early summer harvesting begins. Both men and women engage in this activity, the men doing the reaping with hand

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[829] [1]Coon (1931:47-48) states that rye is highly praised by the Riffian but that since the Arabs scorn it as a foodstuff the Berbers are ashamed to admit its worth.

243 sickles and the women carrying the grain stalks to the threshing areas. The threshing floors are generally merely a circle of dirt ground, although in some areas they are paved. The stalks [231] are placed on this circular floor and mules, donkeys, or cattle are driven about inside the circle, trampling the grain and separating it from the chaff. The grain is further refined by hand-winnowing done by the women. The straw is accumulated in circu- [231] lar stacks to be preserved as food for the animals during the winter months. When relatives have worked a common piece of land 243 465 the yield is divided by measuring off the appropriate amount of grain in straw baskets. If the division is on a one-for-one basis, each alternate basket will go to one of the parties. If the division is at some other ratio, the number of baskets will accordingly be at that ratio. If the land was ploughed, planted [427] and harvested by a akhammas, a sharecropping laborer, the owner of the land will receive four bushels out of every five, the remaining fifth going to the akhammas.

241 Throughout the summer the vegetables, fruits and nuts are harvested as they come ripe. In late summer and early autumn the [465] maize and grapes are harvested. Once again, if the labor of several families or of akhammas has been involved, straw baskets are used to allot out to each man his appropriate portion. It is 585 221 during this period, in the months of August and September, that [241] weddings are held. The agricultural cycle has been completed and there is spare time to arrange the necessary items for a wedding. Also this is the period in which the optimum amount of food is

7: Mikesell K-4,5 (1955-1957) 1961 MX3 Rif MX3
Senhaja MX4

presence of an influential family of *shurfa*, alleged descendants of the Prophet, who encouraged a shift from Berber to Arabic speech. Rifian is spoken in the hamlet of the Aith Azza, but the weekly market of Targist has functioned traditionally as a trading center for the Sanhajan tribes, especially Zarqat. The Aith Mazduwi also appear to be of mixed origin, for both the Sanhajan and Rifian dialects are spoken by this tribe.

Sanhajans and Ghmarans generally regard all tribes to the east of them as Rifian, but among the Aith Bu Yihyi and other tribes of the Kert and Moulouya valleys this appellation is restricted to the tribes of the basin of Wad Nkour. It is useful to think of a zone of transition between the "true Rif"—Aith Wariyaghar, Ibuqquyen, Aith Ammarth, Igzinnayen, Aith Tuzin, Thimsaman—and the eastern frontier of the northern zone. The Ulad Stut are intrusive bedawin, like the Khlut of the Atlantic littoral. The remaining tribes may be described as "eastern Rifians." Two minor confederations are recognized within this group. The first, "Iqar'ayen" in Rifian and "Gal'aya" in Arabic, includes five tribes: Aith Bu Ifrur, Aith Sidar, Imazujen, Aith Bu Gafar, and Aith Shikar. The second, called "Garet" or "Gart" in Arabic, is formed of Ibdharsen and Aith Bu Yihyi. The dialect of the Aith Iznasen is intelligible to most Rifians, but there seems to be general agreement that the Rif, even in a broad sense, does not extend beyond Wad Moulouya.

Land and Livelihood

In the total context of geography, northern Morocco should be described as an isolated and generally inhospitable area. Moving from the Atlantic coast toward the east, the traveler is confronted with an abrupt transition from alluvial plains and terraces to a wild and chaotic zone of steep slopes and narrow ridges. The eastern lowlands are more favorable from a physiographic point of view, but the Rif chain creates a rain shadow, and the tribesmen of the eastern Rif, Garet, and Gal'aya suffer from meager and erratic rainfall. Cut off to the south by the Rif chain and to the north by inhospitable coasts, northern Morocco cannot compare with Greece, Italy, southern France, or Andalusia as a breeding place for advanced civilization. It is a rampart and a place of refuge.

The tribesmen of northern Morocco share an agricultural heritage derived in part from contacts with Phoenicians, Romans, Arabs, and Europeans. Farming methods are primitive, for the mountain tribes learned centuries ago how to grow the maximum amount of food on tiny terraces, and the size of their fields and the steepness of slopes discourage mechanization. Barley and wheat constitute the most important crops. Wherever water is available for irrigation, the cereals, which are dry-farmed, are supplemented by summer crops of maize, legumes, and vegetables. Horticulture provides precious additional food, and during the spring, when cereal stocks are low, raisins, figs, and nuts are staples. In the semiarid lowlands east of the Rif chain, only cereal farming is possible, and famine may be experienced when rains are meager or arrive too late. The great seasonal migration from this area toward the French farms of eastern Algeria resulted from an imbalance between population and food supply.

Variations in crop combinations and diet are partly conditioned by environmental factors, and hence will be considered in greater detail in chapter ii. A

7: Mikesell K-4,5 (1955-1957) 1961 MX3 Rif MX3

Spartel as far as the western flank of Jbil Musa. Today this coast commands one of the world's great trade routes. For the Ancients the Pillars of Hercules marked the end of the known world, the very limits of civilization. In medieval time the Arabs rarely ventured into the Atlantic, and in the great age of exploration the Occidental Muslims limited their activity to piracy. For Morocco this coast has been a bond with Spain. By this almost terrestrial function the Strait of Gibraltar assumed a decisive role in Moroccan history. It was to guard the southern flank of Betica that Emperor Claudius created the province of Mauritania Tingitana in A.D. 46. The proximity of the two shores allowed Islam to conquer the Iberian peninsula, and the Spanish, in turn, to extend their influence to the Moroccan coast.

On the Mediterranean coast Morocco faces the great highway of civilization, but that shore, almost completely devoid of shelter, has never had an important maritime activity. A few fishing boats operate on calm days, but their sole function is to carry nets and seines a short distance beyond the surf. No road or trail of any significance follows this coast. Immediately east of the delta of Río Martín (Wad Martil) the coastline consists of a series of high cliffs cut by deep barrancas (pl. 1, *a*). This pattern, except for the small coastal plain formed by the deltas of Wad Ghis and Wad Nkour, continues as far as Melilla.

Climate

The climate of northern Morocco is of the Mediterranean type. In its simplest form this type of climate is characterized by (1) concentration of precipitation in winter and spring, the summers being nearly or completely dry; (2) warm to hot summers and mild winters; and (3) a high percentage of the possible sunshine for the year. From the Atlantic coast eastward to about 4° west longitude, irrigation is unnecessary for cereal crops. Within this zone the average annual precipitation ranges from 400 mm. to more than 1,000 mm. The extent of this range reflects the extreme contrasts of exposure and elevation. The drier zone, with precipitation totals of 400 mm. or less, begins on the eastern edge of the Rif chain.

Figure 6 was compiled from published records of forty-five weather stations for the decade 1946–1955. The former date is the earliest that can be used if conditions in the entire zone are to be compared. The records of a few stations extend to earlier years, and the Catholic Mission in Tangier has recorded weather observations since 1912. But data have become available for the interior of the zone only since the end of the Second World War.[1]

Precipitation decreases from north to south on the Atlantic coast, and from west to east on the Mediterranean coast. Tangier, with 810 mm. (31.9 in.), is the wettest coastal station in the zone. At Arcila, only 40 km. to the south, the total is 611 mm. (24 in.). On the Mediterranean coast, Ceuta with 560 mm. (22 in.) contrasts with Wad Lao with 460 mm. (18.1 in.), Puerto Capaz with 330 mm.

[1] For observations recorded prior to 1944, see *Resumen de las observaciones meteorológicas efectuadas en la zona de Marruecos hasta 1944* (Tetuán: Imprenta del Majzen, 1946). The years 1944–1946 are covered in a supplement published in 1947. Since the latter date, weather records have been published monthly in the *Boletín Mensual Climatológico del Servicio Meteorológico en Marruecos* (Tetuán: Imprenta del Majzen). For data on precipitation elsewhere in Morocco see *Atlas du Maroc*, Planche 4 *a*, "Précipitations annuelles" (Rabat: Comité de Géographie du Maroc, 1958), and the "Notice explicative" that accompanies the map.

7: Mikesell K-4,5 (1955-1957) 1961 MX3 Rif MX3
Senhaja MX4

zone may be used only for pasture. This arrangement seems orderly and rational, but its effect is to accelerate the deterioration of the land. Grain stubble (which is often grazed) and vines (which are often placed parallel to the slope) do not constitute an adequate protection for the soil. As population increases, the zones of dry farming and pasture are extended to higher slopes. First the forest is destroyed, then the scrub cover is removed, and eventually the zone of dry farming is stripped of soil.[1]

Crop Combinations

The basic crops of northern Morocco are well adapted to the Mediterranean climate, for cereals can be grown during the rainy season, and trees, by virtue of their large root systems, are suited to the long dry summers. When water is available for irrigation, diets are balanced and there is no danger of famine. This

TABLE 4
Land under Cereals
(Hectares)

	1938-40	1951	1952	1953
Barley	75,729	193,600	164,129	174,905
Wheat	30,518	70,895	73,180	76,392
Sorghum	25,656	49,092	51,094	46,981
Maize	4,318	4,992	6,020	6,206
Rye	1,253	3,411	3,724	3,305
Totals	137,474	321,991	298,147	307,789

Source: *Anuario estadistico, 1953-53* (Madrid, 1955), p. 93.

happy combination of dry farming, horticulture, and gardening is realized only in the highlands and on the main river plains. Irrigated land probably accounts for less than 5 per cent of the surface of the northern zone. Most tribesmen depend on the unpredictable rains.

In the whole of Morocco about 90 per cent of the land under field crops is planted to cereals. Table 4 shows the amount of land used for growing cereals in the northern zone. Barley accounts for nearly half of the total cultivated area in the northern zone.[2] One advantage of barley is that it can be cut while green, thus making space for summer crops. When barley is cut green, it is toasted before it is milled, and then is mixed with butter to form a paste. Wheat is more highly prized, but is less successful on thin residual soils. In many areas wheat flour is used only as a flavoring and leavening agent. Rye is grown in the Sanhajan highlands, but is not generally regarded as an important food. No one would think of serving rye bread to a guest. At the approach of a visitor, an attempt may even be made to hide all rye bread. When land is abundant, rye may be grown for use as thatch, and the grain is not collected. In the Rif it used to be a

[1] On the relationship of economic history and erosion, see Paul Vageler, "Zur Bodengeographie Algiers: Faktoren der Bodenbildung und -verteilung. Die Catena als bodengenetische Einheit," *Petermanns Mitt.*, Ergänzungsheft 258 (1955), 88–99.

[2] In 1950 there were 373,482 hectares of land under cultivation in Spanish Morocco. *Anuario estadistico, 1952–53*, p. 91, cited in note 1.

7: Mikesell K-4,5 (1955-1957) 1961 MX3 Rif MX3
Jebala MX2
Senhaja MX4

tradition that rye could be grown on unclaimed land, beyond the reaches of ordinary agriculture.[5]

Hunger or plenty depends largely upon the success or failure of the cereal crop. Tree and garden crops supplement but never supplant the cereals. The most important secondary crops are from fruit and nut trees, which are especially numerous in the western part of the Rif. The most important are the olive, pomegranate, fig, and walnut. Apples and plums are grown by some of the highland tribesmen, who graft them on hawthorns. At lower elevations, especially on south-facing slopes, orange, peach, and apricot trees are occasionally seen.

Dried figs and raisins are second only to the cereals as staple foods. The importance of the trees is indicated by the complicated pattern of their ownership. On a given farm, all the trees may belong to an outside party, perhaps the former owner of the land who refused to relinquish title to his trees. One tree may be owned by several people in partnership, and sometimes different people own different branches, or claim parts of the crop on the ground. At one time the Rifians seem to have used grapes or other fruits to make fermented beverages, for Leo Africanus describes them as being "so excessively given to drink, that they scarcely reserve wherewithal to apparel themselves."[6]

Irrigated plots in the valleys of Wad Ghis and Wad Nkour produce broad beans, chickpeas, potatoes, onions, tomatoes, peppers, carrots, turnips, and squash. Add eggs, and an occasional feast of mutton or goat meat, and you have the main ingredients of the Rifian diet. In recent years fish have been brought in from Alhucemas to the principal rural markets. Fish are regarded as a delicacy, and are usually fried and eaten in the market place.

West of the Rif the dietary situation improves, but it becomes more hazardous toward the east. This distinction is based on the differences in precipitation and runoff. In the eastern lowlands, precipitation is too meager for vines and figs, and extensive irrigation is possible only in the valleys of Wad Kert and Wad Moulouya. The tribesmen of Garet suffer from acute want in any unusually dry year, and most adults remember at least one famine. Garet and Gal'aya are northern Morocco's main areas of emigration.

In the Sanhajan highlands and in most of Ghmara and Jbala, each hamlet has a reliable source of irrigation water. The main irrigated crops are maize, beans, and squash. The planting of beans between the rows of maize may indicate an unformulated appreciation of the value of pulses as restorers of the nitrogen content of the soil. Perhaps not; for the plants in this New World combination seem to have been introduced as one complex by Andalusian refugees.

In most of the central highlands, and especially in Sanhaja as-Srair, *kif*, or hemp (*Cannabis sativa*), is an important cash crop. It is grown under irrigation during the summer, and is usually planted and harvested at about the same time as maize. After it has been reaped, the stems of the plant are submerged in a stream and held down with stones. After two or three days of soaking, the fibers are separated and used to make cord, mats, and baskets.

Traveling from the central highlands toward the Atlantic lowlands, one notes

[5] C. S. Coon, "Tribes of the Rif," *Harvard African Studies*, 9 (1931), 47–48.

[6] Leo Africanus, *The History and Description of Africa* (London: Hakluyt Society, 1896), II, 516.

7: Mikesell K-4,5 (1955-1957) 1961 MX3 Rif MX3
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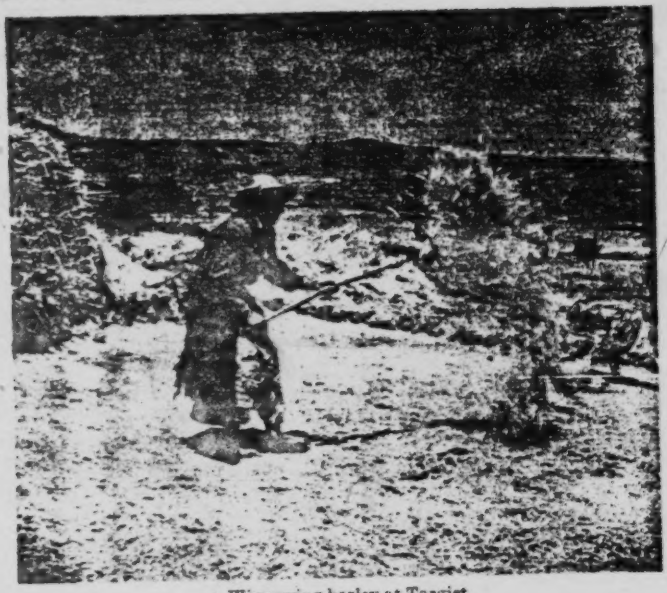

a. Winnowing barley at Targist.

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b. Irrigation ditch near Tlata Ktama.